

CURRICULUM VITAE

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EDUCATION

1991 - Doctor of Philosophy in Computational Science and Informatics
1997 Computational Biology and Neuroscience Track
Dissertation: "A Computational Model of Cerebellar Saccadic Control."
Dissertation Defense: May 1, 1997.
George Mason University, Fairfax, Virginia

1989 - Master's of Science in Computer Science
1991 The George Washington University, Washington, DC.

1981 - Bachelor's of Science in Computer Science
1983 University of Massachusetts, Amherst, Massachusetts

1979 - Brandeis University, Waltham, Massachusetts
1981

TEACHING EXPERIENCE

2008 – Department of Cognitive Science,
Present University of California, Irvine
Courses taught:
Cognitive Neuroscience
Cognitive Robotics
Computational Neuroscience
Cortical Neuroscience
Perceptual Neuroscience

1997 - Assistant Professor
1999 Bioinformatics, Computational Neuroscience

Department of Computational Science and Informatics
George Mason University, Fairfax, Virginia

Courses taught:

Bioinformatics

Computational Neuroscience Systems

1990 - Graduate Teaching Assistant
1991 Senior Microprocessor Laboratory
Department of Electrical Engineering and Computer Science
George Washington University, Washington, D.C.

1989 - Graduate Teaching Assistant
1990 Senior Computer Project Laboratory
Department of Electrical Engineering and Computer Science
George Washington University, Washington, D.C.

EMPLOYMENT

2008 - Professor
Present Department of Cognitive Sciences
Department of Computer Science
University of California, Irvine
Irvine, CA

2011 - Senior Fellow
2007 Theoretical Neurobiology
The Neurosciences Institute
San Diego, CA

1999 - Postdoctoral Fellow
2011 Theoretical Neurobiology
The Neurosciences Institute
San Diego, CA

1999- Consultant
2003 Generation and Description of Dendritic Morphology
Human Brain Project / Neuroinformatics Research Grant
National Institute of Neurological Disorders and Stroke /
National Institute of Mental Health
Grant Number: R01-NS39600-01

1996 - Research Professor
1999 Krasnow Institute for Advanced Study
George Mason University
Fairfax, VA

1997 - Assistant Professor
1999 Department of Computational Science and Informatics
George Mason University, Fairfax, VA

1994 - Chief Scientist
1999 Fatigue and Drug Detection - Oculomotor Measurements
Eye Tracking Software Development
Fitness Impairment Testing
Pulse Medical Instruments, Incorporated, Rockville, MD

1997 - Consultant
1999 Police Executive Research Forum
U.S. Department of Justice's National Institute of Justice
Grant Number: 96-IJ-CS-0046

1993 - Software Engineer
1994 System Services Software
FAA Air Traffic Control Advanced Automation System
Loral Corporation, Rockville, MD

1991 - Software Engineer
1993 System Services Common Code Software
FAA Air Traffic Control Advanced Automation System
IBM Corporation - Federal Systems Company, Rockville, MD

1989 Software Engineer
Infrared guided Missile Seeker software.
Raytheon Corporation, Bedford, MA

1988 - Consultant to Japanese Defense Army
1989 Command and Control software for the PATRIOT Missile System
Mitsubishi Heavy Industries, Nagoya, Japan

1984 - Software Engineer
1989 Training and Simulation software for the PATRIOT Missile system.
Infrared guided Missile Seeker software.
Communications software for the PATRIOT Missile system
Input/Output Processor software for Continuous Wave Radar
Raytheon Corporation, Bedford, MA

PUBLICATIONS

Reprints of publications can be found at: <http://www.socsci.uci.edu/~jkrichma/publications.html>
Google Scholar: <https://scholar.google.com/citations?user=ErpbA8wAAAAJ&hl=en&oi=sra>

BOOKS

1. Hwu, T.J., and Krichmar, J.L. (2022). *Neurorobotics: Connecting the Brain, Body and Environment*. (MIT Press).

EDITED BOOKS

1. Brock, O., & Krichmar, J. L. (Eds.). (2025). *From Animals to Animats 17*. 17th International Conference on Simulation of Adaptive Behavior, SAB 2024 Irvine, CA, USA. Springer Nature.
2. Krichmar, J.L., and Wagatsuma, H., eds. (2011). *Neuromorphic and Brain-Based Robots* (Cambridge University Press).

JOURNAL ARTICLES

1. Kandimalla, S., Wong, Q. Y., Zheng, K., & Krichmar, J. L. (2025). Episodic-like memory in a simulation of cuttlefish behavior. *Scientific Reports*, 16(1), 2169. <https://doi.org/10.1038/s41598-025-31950-x>
2. Espino, H., & Krichmar, J. L. (2025). Adaptive, Goal-Oriented Navigation Using a Model of Directionally-Polarized Place Cells. *Adaptive Behavior*, 10597123251364749. <https://doi.org/10.1177/10597123251364749>
3. Niedermeier, L., Dutt, N., & Krichmar, J. L. (2025). An integrated toolbox for creating neuromorphic edge applications. *Neuromorphic Computing and Engineering*, 5(1), 014003. <https://doi.org/10.1088/2634-4386/adad0f>
4. Espino, H., Bain, R., & Krichmar, J. L. (2024). A Rapid Adapting and Continual Learning Spiking Neural Network Path Planning Algorithm for Mobile Robots. *IEEE Robotics and Automation Letters*, 9(11), 9542-9549. <https://doi.org/10.1109/LRA.2024.3457371>
5. Alonso, N., & Krichmar, J. L. (2024). A sparse quantized hopfield network for online-continual memory. *Nature Communications*, 15(1), 3722. <https://doi.org/10.1038/s41467-024-46976-4>
6. Ahumada-Newhart, V., Kashyap, H.J., Hwu, T., Tian, Y., Mirzakhani, L., Minton, M., Seader, S., Hedden, S., Moore, D., Krichmar, J., and Eccles, J.S. (2023). Evaluation of the Toyota Human Support Robot (HSR) for Social Interaction and Learning. *The International Journal of Technology, Knowledge, and Society* 19, 21-52. doi:10.18848/1832-3669/CGP/v19i01/21-52.
7. Balaji, A., Huynh, P.K., Catthoor, F., Dutt, N.D., Krichmar, J.L., and Das, A. (2023). NeuSB: A Scalable Interconnect Architecture for Spiking Neuromorphic Hardware. *IEEE T Emerg Top Com* 11, 373-387. 10.1109/Tetc.2023.3238708.
8. Chen, K.X., Kashyap, H.J., Krichmar, J.L., and Li, X.M. (2023). What can computer vision learn from visual neuroscience? Introduction to the special issue. *Biol Cybern* 117, 297-298. 10.1007/s00422-023-00977-6.

9. Kopsick, J.D., Tecuatl, C., Moradi, K., Attili, S.M., Kashyap, H.J., Xing, J.W., Chen, K.X., Krichmar, J.L., and Ascoli, G.A. (2022). Robust Resting-State Dynamics in a Large-Scale Spiking Neural Network Model of Area CA3 in the Mouse Hippocampus. *Cogn Comput.* vol. 15, no. 4, pp. 1190-1210, DOI:10.1007/s12559-021-09954-2.
10. Xing, J., Nagata, T., Zou, X., Neftci, E., and Krichmar, J.L. (2023). Achieving efficient interpretability of reinforcement learning via policy distillation and selective input gradient regularization. *Neural Networks* 161, 228-241. <https://doi.org/10.1016/j.neunet.2023.01.025>.
11. Chen, K., Beyeler, M., and Krichmar, J.L. (2022). Cortical Motion Perception Emerges from Dimensionality Reduction with Evolved Spike-Timing-Dependent Plasticity Rules. *The Journal of Neuroscience* 42, 5882. 10.1523/JNEUROSCI.0384-22.2022.
12. Krichmar, J.L., and Hwu, T.J. (2022). Design Principles for Neurorobotics. *Front Neurorobotics* 16. 10.3389/fnbot.2022.882518.
13. Kudithipudi, D., Aguilar-Simon, M., Babb, J., Bazhenov, M., Blackiston, D., Bongard, J., Brna, A.P., Chakravarthi Raja, S., Cheney, N., Clune, J., et al. (2022). Biological underpinnings for lifelong learning machines. *Nature Machine Intelligence* 4, 196-210. 10.1038/s42256-022-00452-0.
14. Titirsha, T., Song, S., Das, A., Krichmar, J., Dutt, N., Kandasamy, N., and Catthoor, F. (2022). Endurance-Aware Mapping of Spiking Neural Networks to Neuromorphic Hardware. *IEEE Transactions on Parallel and Distributed Systems* 33, 288-301.
15. Xing, J., Chrastil, E.R., Nitz, D.A., and Krichmar, J.L. (2022). Linking global top-down views to first-person views in the brain. *Proceedings of the National Academy of Sciences* 119, e2202024119. 10.1073/pnas.2202024119.
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17. Krichmar, J.L. (2021). Gerald Edelman's Steps Toward a Conscious Artifact. *Journal of Artificial Intelligence and Consciousness*, 1-9. DOI: <https://doi.org/10.1142/S2705078521500144>
18. Krichmar, J.L., Olds, J.L., Sanchez-Andres, J.V., and Tang, H. (2021). Editorial: Explainable Artificial Intelligence and Neuroscience: Cross-Disciplinary Perspectives. *Front Neurorobotics* 15.
19. Kashyap, H.J., Fowlkes, C.C., and Krichmar, J.L. (2021). Sparse Representations for Object- and Ego-Motion Estimations in Dynamic Scenes. *IEEE Transactions on Neural Networks and Learning Systems* 32, 2521-2534.
20. Balaji, A., Song, S., Das, A., Krichmar, J., Dutt, N., Shackleford, J., Kandasamy, N., and Catthoor, F. (2021). Enabling Resource-Aware Mapping of Spiking Neural Networks via Spatial Decomposition. *IEEE Embedded Systems Letters* 13, 142-145.
21. Chen, K., Hwu, T., Kashyap, H.J., Krichmar, J.L., Stewart, K., Xing, J., and Zou, X. (2020). Neurorobots as a Means Toward Neuroethology and Explainable AI. *Front Neurorobotics*, 14. doi: 10.3389/fnbot.2020.570308.
22. Zou, X., Kolouri, S., Pilly, P.K., and Krichmar, J.L. (2020). Neuromodulated attention and goal-driven perception in uncertain domains. *Neural Networks* 125, 56-69.
23. Hwu, T., and Krichmar, J.L. (2020). A neural model of schemas and memory encoding. *Biological Cybernetics*, 114, 169-186.
24. Chiba, A.A., and Krichmar, J.L. (2020). Neurobiologically Inspired Self-Monitoring Systems. *Proceedings of the IEEE* 108, 976-986.

25. Balaji, A., Das, A., Wu, Y., Huynh, K., Dell'Anna, F.G., Indiveri, G., Krichmar, J.L., Dutt, N.D., Schaafsma, S., and Catthoor, F. (2020). Mapping Spiking Neural Networks to Neuromorphic Hardware. *IEEE Transactions in VLSI Systems*, 28, 76-86.
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27. Balaji, A., Song, S.H., Das, A., Dutt, N., Krichmar, J., Kandasamy, N., and Catthoor, F. (2019). A Framework to Explore Workload-Specific Performance and Lifetime Trade-offs in Neuromorphic Computing. *Ieee Comput Archit L* 18, 149-152.
28. Beyeler, M., Rounds, E.L., Carlson, K.D., Dutt, N., and Krichmar, J.L. (2019). Neural correlates of sparse coding and dimensionality reduction. *Plos Comput Biol* 15.
29. Krichmar, J.L., Severa, W., Khan, M.S., and Olds, J.L. (2019). Making BREAD: Biomimetic Strategies for Artificial Intelligence Now and in the Future. *Front Neuroscience* 13.
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31. Krichmar, J.L., Hwu, T., Zou, X., Hylton, T. (2019). Advantage of prediction and mental imagery for goal-directed behaviour in agents and robots. *Cognitive Computation and Systems*. DOI: 10.1049/ccs.2018.0002.
32. Krichmar, J.L. (2018). Neurorobotics—A Thriving Community and a Promising Pathway Toward Intelligent Cognitive Robots. *Frontiers in Neurorobotics* 12:42, 1-11.
33. Hwu, T., Wang, A.Y., Oros, N., and Krichmar, J.L. (2018). Adaptive Robot Path Planning Using a Spiking Neuron Algorithm With Axonal Delays. *IEEE Transactions on Cognitive and Developmental Systems* 10, 126-137. ***IEEE CIS TCDS Outstanding Paper Award.***
34. Rounds, E.L., Alexander, A.S., Nitz, D.A., and Krichmar, J.L. (2018). Conjunctive coding in an evolved spiking model of retrosplenial cortex. *Behav Neuroscience*. DOI: 10.1037/bne0000236
35. Tang, H., Huang, T., Krichmar, J.L., Orchard, G., and Basu, A. (2018). Guest Editorial Special Issue on Neuromorphic Computing and Cognitive Systems. *IEEE Transactions on Cognitive and Developmental Systems* 10, 122-125.
36. Venkadesh, S., Komendantov, A.O., Listopad, S., Scott, E.O., De Jong, K., Krichmar, J.L., and Ascoli, G.A. (2018). Evolving Simple Models of Diverse Intrinsic Dynamics in Hippocampal Neuron Types. *Frontiers in Neuroinformatics* 12.
37. Das, A., Pradhapan, P., Groenendaal, W., Adiraju, P., Rajan, R.T., Catthoor, F., Schaafsma, S., Krichmar, J.L., Dutt, N., and Van Hoof, C. (2018). Unsupervised heart-rate estimation in wearables with Liquid states and a probabilistic readout. *Neural Netw* 99, 134-147.
38. Avery, M.C., and Krichmar, J.L. (2017). Neuromodulatory Systems and Their Interactions: A Review of Models, Theories, and Experiments. *Frontiers in Neural Circuits* 11.
39. Beyeler, M., Rounds, E.L., Carlson, K.D., Dutt, N., and Krichmar, J.L. (2017). Sparse coding and dimensionality reduction in cortex. *bioRxiv*, DOI: 10.1101/149880

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42. Hwu, T., Isbell, J., Oros, N., and Krichmar, J. (2016). A Self-Driving Robot Using Deep Convolutional Neural Networks on Neuromorphic Hardware. arXiv arXiv:1611.01235 [cs.NE].
43. Beyeler, M., Dutt, N., and Krichmar, J.L. (2016). 3D Visual Response Properties of MSTd Emerge from an Efficient, Sparse Population Code. *The Journal of Neuroscience* 36, 8399-8415.
44. Craig, A.B., Phillips, M.E., Zaldivar, A., Bhattacharyya, R., and Krichmar, J.L. (2016). Investigation of biases and compensatory strategies using a probabilistic variant of the Wisconsin Card Sorting Test. *Frontiers in Psychology* 7:17.
45. Krichmar, J.L., Conradt, J., and Asada, M. (2015). Neurobiologically Inspired Robotics: Enhanced Autonomy through Neuromorphic Cognition. *Neural Networks*, 72, 1-2.
46. Beyeler, M., Oros, N., Dutt, N., and Krichmar, J.L. (2015). A GPU-accelerated cortical neural network model for visually guided robot navigation. *Neural Networks*, 72, 75-87.
47. Asher, D.E., Oros, N., and Krichmar, J.L. (2015). The Importance of Lateral Connections in the Parietal Cortex for Generating Motor Plans. *PLoS ONE* 10, e0134669.
48. Chou, T.-S., Bucci, L.D., and Krichmar, J.L. (2015). Learning Touch Preferences with a Tactile Robot Using Dopamine Modulated STDP in a Model of Insular Cortex. *Frontiers in Neurorobotics* 9.
49. Avery, M., and Krichmar, J.L. (2015). Improper activation of D1 and D2 receptors leads to excess noise in prefrontal cortex. *Frontiers in Computational Neuroscience* Vol. 9, Article 31, 1-15.
50. Krichmar, J.L., Coussy, P., and Dutt, N. (2015). Large-Scale Spiking Neural Networks using Neuromorphic Hardware Compatible Models. *ACM Journal on Emerging Technologies in Computing Systems*, Vol. 11, No. 4, Article 36, 1-18.
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53. Beyeler, M., Richert, M., Dutt, N.D., and Krichmar, J.L. (2014). Efficient Spiking Neural Network Model of Pattern Motion Selectivity in Visual Cortex. *Neuroinformatics*.
54. Avery, M.C., Dutt, N., and Krichmar, J.L. (2014). Mechanisms underlying the basal forebrain enhancement of top-down and bottom-up attention. *The European journal of neuroscience* 39, 852-865.
55. Oros, N., Chiba, A.A., Nitz, D.A., and Krichmar, J.L. (2014). Learning to ignore: A modeling study of a decremental cholinergic pathway and its influence on attention and learning. *Learning & Memory* 21, 105-118.

56. Asher, D.E., Craig, A.B., Zaldivar, A., Brewer, A.A., and Krichmar, J.L. (2013). A dynamic, embodied paradigm to investigate the role of serotonin in cost and decision-making. *Frontiers in Integrative Neuroscience* 7.
57. Avery, M., Dutt, N., and Krichmar, J.L. (2013). A large-scale neural network model of the influence of neuromodulatory levels on working memory and behavior. *Frontiers in Computational Neuroscience* 7.
58. Zaldivar, A., and Krichmar, J.L. (2013). Interactions between the neuromodulatory systems and the amygdala: exploratory survey using the Allen Mouse Brain Atlas. *Brain structure & function* 218, 1513-1530.
59. Krichmar, J.L., and Röhrbein, F. (2013). Value and Reward Based Learning in Neurorobots. *Frontiers in neurorobotics* 7.
60. Beyeler, M., Dutt, N.D., and Krichmar, J.L. (2013). Categorization and decision-making in a neurobiologically plausible spiking network using a STDP-like learning rule. *Neural Networks* 48, 109-124.
61. Craig, A.B., Asher, D.E., Oros, N., Brewer, A.A., and Krichmar, J.L. (2013). Social contracts and human-computer interaction with simulated adapting agents. *Adaptive Behavior* 21, 371-387.
62. Krichmar, J.L. (2013). A neurorobotic platform to test the influence of neuromodulatory signaling on anxious and curious behavior. *Frontiers in neurorobotics* 7:1, 1-17.
63. Asher, D.E., Zaldivar, A., Barton, B., Brewer, A.A., and Krichmar, J.L. (2012). Reciprocity and Retaliation in Social Games With Adaptive Agents. *IEEE Transactions on Autonomous Mental Development* 4, 226-238.
64. Krichmar, J.L. (2012). Design principles for biologically inspired cognitive robotics. *Biologically Inspired Cognitive Architectures* 1, 73-81.
65. Avery, M.C., Nitz, D.A., Chiba, A.A., and Krichmar, J.L. (2012). Simulation of Cholinergic and Noradrenergic Modulation of Behavior in Uncertain Environments. *Frontiers in Computational Neuroscience* 6, 1-16.
66. Richert, M., Nageswaran, J.M., Dutt, N., and Krichmar, J.L. (2011). An efficient simulation environment for modeling large-scale cortical processing. *Frontiers in Neuroinformatics* 5, 1-15.
67. Cox, B.R., and Krichmar, J.L. (2009). Neuromodulation as a Robot Controller: A Brain Inspired Design Strategy for Controlling Autonomous Robots. *IEEE Robotics & Automation Magazine* 16, 72-80.
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71. McKinstry, J.L., Seth, A.K., Edelman, G.M., and Krichmar, J.L. (2008). Embodied Models of Delayed Neural Responses: Spatiotemporal Categorization and Predictive Motor Control in Brain Based Devices. *Neural Networks* 21, 553–561.

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78. Seth, A. K., Sporns, O., and Krichmar, J. L. (2005) *Neurorobotic Models in Neuroscience and Neuroinformatics*. *Neuroinformatics*, 3: 167-170.
79. Krichmar, J. L., Nitz, D. A., Gally, J. A., and Edelman, G. M. (2005) *Characterizing functional hippocampal pathways in a brain-based device as it solves a spatial memory task*. *Proceedings of the National Academy of Sciences USA*, 2005: 102, 2111-2116.
80. Krichmar, J.L. and G.M. Edelman, (2005) *Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines*. *Artificial Life*, 11(1-2): p. 63-78.
81. Rowland, L. M., Thomas, M. L., Thorne, D. R., Sing, H. C., Krichmar, J. L., Davis, H. Q., Balwinski, S. M., Peters, R. D., Kloeppe-Wagner, E., Redmond, D. P., Alicandri, E. Belenky, G.. (2005). Oculomotor responses during partial and total sleep deprivation. *Aviat Space Environ Med* 76, C104-113.
82. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Visual binding through reentrant connectivity and dynamic synchronization in a brain-based device*. *Cerebral Cortex*, 2004: 14:11 p. 1185-1199.
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89. Krichmar, J.L., *Evolving Intelligent Robots: review of "Evolutionary Robotics: The biology, Intelligence, And Technology of Self-Organizing Machines" by S. Nolfi and D. Floreano*. Complexity, 2001. **6**(3): p. 51-53.
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91. Nasuto, S.J., R. Scorcioni, J.L. Krichmar, and G.A. Ascoli, *Algorithmic statistical analysis of electrophysiological data for the investigation of structure-activity relationship in single neurons*. InterJournal of Complex Systems, 2001. **Report 389**.
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1. Espino, H., & Krichmar, J. L. (2025). Vector-Based Navigation Inspired by Directional Place Cells. In O. Brock & J. Krichmar (Eds.), From Animals to Animats 17 (pp. 27-38). Springer Nature Switzerland.
2. Mohaddesi, S. A., Hegarty, M., Chrastil, E. R., & Krichmar, J. L. (2025). Benefit of Varying Navigation Strategies in Robot Teams. In O. Brock & J. Krichmar (Eds.), From Animals to Animats 17 (pp. 63-77). Springer Nature Switzerland.
3. Pae, H., & Krichmar, J. L. (2025). Integrated Information in Genetically Evolved Braitenberg Vehicles. In O. Brock & J. Krichmar (Eds.), From Animals to Animats 17 (pp. 236-247). Springer Nature Switzerland.
4. Pfeiffer, M. A., Kandimalla, S., Liu, J., Hsu, K., Kirshner, E. J., Yuan, A., Lui, H. W., & Krichmar, J. L. (2025). CuttleBot: Emulating Cuttlefish Behavior and Intelligence in a Novel Robot Design. In O. Brock & J. Krichmar (Eds.), From Animals to Animats 17 (Vol. 14993, pp. 93-105). Lecture Notes in Artificial Intelligence, Springer Nature.

5. Pan, G., Weiss, T., Mohaddesi, S. A., Szura, J. W., & Krichmar, J. L. (2024, 20-23 May 2024). Navigation and Cognitive Load in Telepresence Robots. 2024 IEEE International Conference on Development and Learning (ICDL).
6. Alonso, N., Krichmar, J., & Neftci, E. (2024). Understanding and Improving Optimization in Predictive Coding Networks. *Proceedings of the AAAI Conference on Artificial Intelligence*, 38(10), 10812-10820. <https://doi.org/10.1609/aaai.v38i10.28954>.
7. Espino, H., Bain, R., and Krichmar, J.L. (2023). Selective Memory Replay Improves Exploration in a Spiking Wavefront Planner. *IEEE International Joint Conference on Neural Networks*. DOI:10.1109/Ijcn54540.2023.10191940.
8. Niedermeier, L., and Krichmar, J.L. (2023). Experience-Dependent Axonal Plasticity in Large-Scale Spiking Neural Network Simulations. *IEEE International Joint Conference on Neural Networks*. DOI: 10.1109/IJCNN54540.2023.10191241
9. Burachas, G., Grigsby, S., Ferguson, B., Krichmar, J., and Rao, R. (2022). Metacognitive Mechanisms for Novelty Processing: Lessons for AI. *AAAI Spring Symposium*.
10. Krichmar, J.L., Ketz, N.A., Pilly, P.K., and Soltoggio, A. (2022). Flexible Path Planning in a Spiking Model of Replay and Vicarious Trial and Error. In L. Cañamero, P. Gaussier, M. Wilson, S. Boucenna, and N. Cuperlier, eds. *From Animals to Animats 16 - Simulation of Adaptive Behavior*. Springer International Publishing.
11. Niedermeier, L., Chen, K., Xing, J., Das, A., Kopsick, J., Scott, E., Sutton, N., Weber, K., Dutt, N., and Krichmar, J.L. (2022). CARLsim 6: An Open Source Library for Large-Scale, Biologically Detailed Spiking Neural Network Simulation. *2022 International Joint Conference on Neural Networks (IJCNN)*.
12. Xing, J., Zou, X., Pilly, P.K., Ketz, N.A., and Krichmar, J.L. (2022). Adapting to Environment Changes Through Neuromodulation of Reinforcement Learning. held in Cham, L. Cañamero, P. Gaussier, M. Wilson, S. Boucenna, and N. Cuperlier, eds. (Springer International Publishing), pp. 115-126.
13. Alonso, N., Millidge, B., Krichmar, J., & Neftci, E. (2022). A Theoretical Framework for Inference Learning. *Advances in Neural Information Processing Systems*, Eds. Alice H. Oh, Alekh Agarwal, Danielle Belgrave, and Kyunghyun Cho. <https://openreview.net/forum?id=7yJMZwhIC2k>.
14. Chen, K., Johnson, A., O., S.E., Xinyun, Z., D., D.J.K., A., N.D., and L., K.J. (2021). Differential Spatial Representations in Hippocampal CA1 and Subiculum Emerge in Evolved Spiking Neural Networks. Paper presented at: *International Joint Conference on Neural Networks (IJCNN)*.
15. Xing, J., Nagata, T., Zou, X., Neftci, E., and Krichmar, J.L. (2021). Domain Adaptation In Reinforcement Learning Via Latent Unified State Representation. In *Proceedings of the AAAI Conference on Artificial Intelligence*, pp. 10452-10459.
16. Zou, X., Scott, E.O., Johnson, A.B., Chen, K., Nitz, D.A., Jong, K.A.D., and Krichmar, J.L. (2021). Neuroevolution of a Recurrent Neural Network for Spatial and Working Memory in a Simulated Robotic Environment. Paper presented at: *Genetic and Evolutionary Computation Conference (GECCO) (Lille, France: ACM)*.
17. Balaji, A., Adiraju, P., Kashyap, H.J., Das, A., Krichmar, J.L., Dutt, N.D., and Catthoor, F. (2020). PyCARL: A PyNN Interface for Hardware-Software Co-Simulation of Spiking Neural Network. *IEEE International Joint Conference on Neural Networks (IJCNN)*.
18. Zou, X., Hwu, T., Krichmar, J., and Neftci, E. (2020). Terrain Classification with a Reservoir-Based Network of Spiking Neurons. Paper presented at: *2020 IEEE*

International Symposium on Circuits and Systems (ISCAS). pp. 1-5. doi:
10.1109/ISCAS45731.2020.9180740

19. Hwu, T., Kashyap, H.J., and Krichmar, J.L. (2020). A Neurobiological Schema Model for Contextual Awareness in Robotics. In IEEE International Joint Conference on Neural Networks (IJCNN) (Glasgow). **Outstanding Paper Award.**
20. Xing, J., Zou, X., and Krichmar, J.L. (2020). Neuromodulated Patience for Robot and Self-Driving Vehicle Navigation. Paper presented at: IEEE International Joint Conference on Neural Networks (IJCNN) (Glasgow).
21. Chou, T.-S., Kashyap, H.J., Xing, J., Listopad, S., Rounds, E.L., Beyeler, M., Dutt, N., and Krichmar, J.L. (2018). CARLsim 4: An Open Source Library for Large Scale, Biologically Detailed Spiking Neural Network Simulation using Heterogeneous Clusters. Paper presented at: International Joint Conference on Neural Networks (IJCNN) (Rio De Janeiro: IEEE Explore).
22. Kashyap, H.J., Detorakis, G., Dutt, N., Krichmar, J.L., and Neftci, E. (2018). A Recurrent Neural Network Based Model of Predictive Smooth Pursuit Eye Movement in Primates. Paper presented at: International Joint Conference on Neural Networks (IJCNN) (Rio De Janeiro: IEEE Explore).
23. Krichmar, J.L., and Chou, T.-S. (2018). A Tactile Robot for Developmental Disorder Therapy. Paper presented at: Technology, Mind, and Society (Washington, DC: ACM).
24. Hwu, T., Isbell, J., Oros, N., and Krichmar, J. (2017a). A Self-Driving Robot Using Deep Convolutional Neural Networks on Neuromorphic Hardware. Paper presented at: IEEE International Joint Conference on Neural Networks (Anchorage, AK).
25. Hwu, T., Krichmar, J.L., and Zou, X. (2017b). A Complete Neuromorphic Solution to Outdoor Navigation and Path Planning. Paper presented at: IEEE International Symposium on Circuits & Systems (ISCAS) (Baltimore, MD).
26. Rounds, E.L., Scott, E.O., Alexander, A.S., De Jong, K.A., Nitz, D.A., and Krichmar, J.L. (2016). An Evolutionary Framework for Replicating Neurophysiological Data with Spiking Neural Networks. Paper to be presented at the 14th International Conference of Parallel Problem Solving from Nature (PPSN). Edinburgh, Scotland.
27. Krichmar, J.L. (2016). Path Planning using a Spiking Neuron Algorithm with Axonal Delays. Paper Presented at the 2016 IEEE Congress on Evolutionary Computation. Vancouver. pp. 1219-1226.
28. Beyeler, M.*, Carlson, K.D.*, Chou, T.-S.*, Dutt, N., and Krichmar, J.L. (2015). CARLsim 3: A User-Friendly and Highly Optimized Library for the Creation of Neurobiologically Detailed Spiking Neural Networks. Paper presented at: International Joint Conference on Neural Networks (Killarney, Ireland: IEEE Explore). (*co-first authors).
29. Asher, D.E., Krichmar, J.L., and Oros, N. (2014). Evolution of Biological Plausible Neural Networks Performing a Visually Guided Reaching Task. Paper presented at: Genetic and Evolutionary Computation Conference (GECCO) (Vancouver: ACM).
30. Bucci, L.D., Chou, T.S., and Krichmar, J.L. (2014). Tactile Sensory Decoding in a Neuromorphic Interactive Robot. Paper presented at: 2014 IEEE Conference on Robotics and Automation (Hong Kong).
31. Carlson, K.D., Beyeler, M., Dutt, N., and Krichmar, J.L. (2014). GPGPU Accelerated Simulation and Parameter Tuning for Neuromorphic Applications. . Paper presented at:

- Proceedings of the 19th Asia and South Pacific Design Automation Conference (ASP-DAC'14) (Singapore: IEEE).
32. Oros, N., and Krichmar, J.L. (2013). Smartphone Based Robotics: Powerful, Flexible and Inexpensive Robots for Hobbyists, Educators, Students and Researchers (Center for Embedded Computer Systems, University of California, Irvine), pp. 1-11.
 33. Carlson, K.D., Richert, M., Dutt, N., and Krichmar, J.L. (2013). Biologically Plausible Models of Homeostasis and STDP: Stability and Learning in Spiking Neural Networks. Paper presented at: International Joint Conference on Neural Networks (Dallas, TX: IEEE Explore).
 34. Oros, N., and Krichmar, J.L. (2012). Neuromodulation, Attention and Localization Using a Novel Android™ Robotic Platform. In ICDL-EpiRob 2012 : IEEE Conference on Development and Learning and Epigenetic Robotics (San Diego, CA: IEEE Explore).
 35. Chelian, S.E., Oros, N., Zaldivar, A., Krichmar, J., and Bhattacharyya, R. (2012). Model of the interactions between neuromodulators and prefrontal cortex during a resource allocation task. Paper presented at: IEEE International Conference on Development and Learning and Epigenetic Robotics (San Diego, CA: IEEE Explore).
 36. Asher, D.E., Zhang, S., Zaldivar, A., Lee, M.D., and Krichmar, J.L. (2012). Modeling individual differences in socioeconomic game playing. Paper presented at: COGSCI 2012 - The Annual Meeting of the Cognitive Science Society (Sapporo, Japan).
 37. Avery, M., Krichmar, J.L., and Dutt, N. (2012). Spiking Neuron Model of Basal Forebrain Enhancement of Visual Attention. Paper presented at: IEEE World Congress on Computational Intelligence (Brisbane, Australia).
 38. Krichmar, J.L. (2012). A Biologically Inspired Action Selection Algorithm Based on Principles of Neuromodulation. Paper presented at: IEEE World Congress on Computational Intelligence (Brisbane, Australia).
 39. Krichmar, J.L., Dutt, N., Nageswaran, J.M., and Richert, M. (2011). Neuromorphic Modeling Abstractions and Simulation of Large-Scale Cortical Networks. Paper presented at: IEEE/ACM International Conference on Computer-Aided Design (ICCAD) (San Jose, CA).
 40. Krichmar, J.L., and Wagatsuma, H. (2011). Neuromorphic and Brain-Based Robots. In Biologically Inspired Cognitive Architectures, A.V. Samsonovich, and K.R. Jóhannsdóttir, eds. (IOS Press), pp. 209-214.
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 42. Asher, D.E., Zaldivar, A., and Krichmar, J.L. (2010). Effect of Neuromodulation on Performance in Game Playing: A Modeling Study. Paper presented at: International Conference on Development and Learning (Ann Arbor, Michigan, IEEE Xplore).
 43. Zaldivar, A., Asher, D.E., and Krichmar, J.L. (2010). Simulation of How Neuromodulation Influences Cooperative Behavior Paper presented at: Simulation of Adaptive Behavior: From Animals to Animats (Paris, France, Springer Lecture Notes on Artificial Intelligence).

44. Moorkanikara Nageswaran, J., Dutt, N., Krichmar, J.L., Nicolau, A., and Veidenbaum, A. (2009). "Efficient Simulation of Large-Scale Spiking Neural Networks Using CUDA Graphics Processors." Paper presented at: IJCNN (Atlanta, GA).
45. Krichmar J.L. (2008), Neuromodulation and Time-Dependent Plasticity in a Model of Foraging Behavior, IEEE 7th International Conference on Development and Learning, Monterey, CA.
46. Krichmar, J.L., and Edelman, G.M. (2007). Design Principles and Constraints Underlying the Construction of Brain-Based Devices. In Lecture Notes in Computer Science: Neural Information Processing (Berlin, Springer-Verlag).
47. Krichmar, J. L., and Edelman, G. M. (2006). *Principles Underlying the Construction of Brain-Based Devices*, In Adaptation in Artificial and Biological Systems, T. Kovacs, and J. A. R. Marshall, eds. (Bristol UK: Society for the Study of Artificial Intelligence and the Simulation of Behaviour), pp. 37-42.
48. Fleischer, J.G., Szatmary, B., Hutson, D., Moore, D.A., Snook, J.A., Edelman, G.M., and Krichmar, J.L. (2006). *A neurally controlled robot competes and cooperates with humans in Segway soccer*, IEEE International Conference on Robotics and Automation (Orlando, FL).
49. Krichmar, J.L., D.A. Nitz, and G.M. Edelman. *Object recognition, Adaptive Behavior and Learning in Brain-Based Devices*. in *Third International Conference on Development and Learning*. 2004. La Jolla, CA.
50. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Texture discrimination by an autonomous mobile brain-based device with whiskers*, in *IEEE International Conference on Robotics and Automation*. 2004: New Orleans, LA. p. 4925-4930.
51. Seth, A.K., J.L. McKinstry, G.M. Edelman, and J.L. Krichmar, *Spatiotemporal processing of whisker input supports texture discrimination by a brain-based device*, in *Animals to Animats 8: Proceedings of the Eighth International Conference on the Simulation of Adaptive Behavior*, S. Schaal, A. Ijspeert, A. Billard, S. Vijayakumar, J. Hallam, and J.A. Meyer, Editors. 2004, The MIT Press: Cambridge, MA.
52. Krichmar, J.L. and G.M. Edelman, *Brain-Based Devices: Intelligent Systems Based on Principles of the Nervous System*, in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2003: Las Vegas, NV. p. 940-945.
53. Krichmar, J.L. and J.A. Snook, *A neural approach to adaptive behavior and multi-sensor action selection in a mobile device*, in *IEEE Conference on Robotics and Automation*. 2002: Washington, D.C. p. 3864-3869.
54. Nasuto, S.J., R. Scorcioni, J.L. Krichmar, and G.A. Ascoli, *Algorithmic statistical analysis of electrophysiological data for the investigation of structure-activity relationship in single neurons*. InterJournal of Complex Systems, 2001. **Report 389**.
55. Krichmar, J.L., J.A. Snook, G.M. Edelman, and O. Sporns, *Experience-dependent Perceptual Categorization in a Behaving Real-World Device*, in *Animals to Animats 6: Proceedings of the Sixth International Conference on the Simulation of Adaptive Behavior*, J.-A. Meyer, A. Berthoz, D. Floreano, H. Roitblat, and S.W. Wilson, Editors. 2000, A Bradford Book. The MIT Press: Cambridge, MA. p. 41-50.

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57. Krichmar, J.L., G.A. Ascoli, L. Hunter, and J.L. Olds, *Qualitative reasoning as a modeling tool for computational neuroscience*, in *Computational Neuroscience: Trends in Research*, J.M. Bower, Editor. 1998, Plenum Press: New York.
58. Vandersluis, J.P., J.D. Cooke, G.A. Ascoli, J.L. Krichmar, G.S. Michaels, M. Montgomery, J. Symanzik, and B. Vitucci, *Exploratory Statistical Graphics for an Initial Motion Control Experiment*. Computing Science and Statistics, 1998. **30**: p. 482-487.
59. Hunter, L., J.L. Krichmar, and J.L. Olds. *Qualitative reasoning as a tool for computational neuroscience*. in *Proceedings of the 11th International Workshop on Qualitative Reasoning*. 1997. Pavia, Italy: Istituto di Analisi Numerica C.N.R.
60. Krichmar, J.L., *Qualitative Reasoning in Neural Modeling: Hodgkin-Huxley Revisited*, in *Intelligent Engineering Through Artificial Neural Networks*, C.H. Dagli, F. B.R., G. J., and K. R.T., Editors. 1994, ASME Press: New York. p. 567-572.
61. Greene, H.J. and J.L. Krichmar, *A Case Study in Data Management in the Air Traffic Control Advanced Automation System*, in *Studies in Computer and Communications Systems*, W.J. Taylor, Editor. 1992, IOS Press: London. p. 85-103.

BOOK CHAPTERS

1. Hwu, T.J., and Krichmar, J.L. (2022). Neurorobotics: Neuroscience and Robots. In Cognitive Robotics, A. Cangelosi, and M. Asada, eds. (The MIT Press), pp. 19-40. 10.7551/mitpress/13780.003.0006.
2. Avery, M.C. and Krichmar, J.L. (2017), *Models of Neuromodulation in Computational Models of Brain and Behavior*, A. Moustafa, Editor, John Wiley & Sons Limited.
3. Krichmar, J.L., and Wagatsuma, H. (2011). History and potential of neuromorphic robotics. In *Neuromorphic and Brain-Based Robots*, J.L. Krichmar, and H. Wagatsuma, eds. (Cambridge University Press), pp. 3-7.
4. Krichmar, J.L. and S.J. Nasuto, *The relationship between neuronal shape and neuronal activity*, in *Computational Neuroanatomy: Principles and Methods*, G.A. Ascoli, Editor. 2002, Humana Press Inc. p. 105-125.
5. Krichmar, J. L., and Reeke, G. N. (2005). The Darwin Brain-Based Automata: Synthetic Neural Models and Real-World Devices, In *Modeling in the Neurosciences: From Biological Systems to Neuromimetic Robotics*, G. N. Reeke, R. R. Poznanski, K. A. Lindsay, J. R. Rosenberg, and O. Sporns, eds. (Boca Raton: Taylor & Francis), pp. 613-638.

FUNDING

Air Force Office of Scientific Research (AFOSR)
 Defense Advanced Research Projects Agency (DARPA)
 National Institute of Neural Disorders and Stroke (NIH)
 National Science Foundation (NSF)

Toyota Motor North America (TMNA)

PATENTS

1. Chelian; S.E., Ziegler; M., Benvenuto; J., Krichmar; J.L., O'Reilly; R.C., Bhattacharyya; R., "Method and apparatus for proactive and reactive cognitive control using models of the anterior cingulate cortex and the neuromodulatory system", 10,635,971, 4/28/2020.
2. Bucci, L.D., Chou, T.-S., Krichmar, J.L., "Tactile, interactive neuromorphic robots", 9,975,038, 5/22/2018.
3. Snook, J.A., Hutson, D.B., Krichmar, J.L., "Special purpose processor implementing a synthetic neural model of the human brain", 8,126,828, 2/28/12.
4. Fleischer, J.G., Szatmary, B., Hutson, D.B., Moore, D.A., Snook, J.A., Edelman, G.M., Krichmar; J.L., "Hybrid Control Device", 7,765,029, 7/27/10.
5. Snook, J.A., Hutson, D.B., Krichmar, J.L., "Neural Modeling and Brain-Based Devices Using Special Purpose Processor", 7,533,071, 5/12/09.
6. Edelman, G.M, Krichmar, J.L., Nitz, D.A., "Mobile brain-based device having a simulated nervous system based on the hippocampus", Patent Number: 7,467,115, Issue Date: 12/16/2008.
7. Seth, A.K. McKinstry, J.L., Edelman, G.M., Krichmar, J.L., "Mobile brain-based device for use in a real world environment", 7,519,452, Issue Date: 4/14/2009.
8. McKinstry, J.L., Edelman; G.M., Krichmar, J.L., "Brain-based device having a cerebellar model for predictive motor control", 7,827,124, Issue Date: November 2, 2010.
9. Rafal, M., Krichmar, J.L., Starin, E., "Pupil Detection System", Patent Number: 5610673, Issue Date: 3/11/1997.

WORKSHOPS AND MEETINGS ORGANIZED

Conference Chair, From Animals to Animats: 17th International Conference on the Simulation of Adaptive Behavior (SAB 2024).

Steering Committee, 2018 conference on "Technology, Mind & Society", American Psychological Association, Washington DC.

Session Chair, "Advanced Unmanned Systems: Requirements and Groundwork for the Next Generation of Robotics Systems", The 8th International Conference on Applied Human Factors and Ergonomics (AHFE 2017).

Session Chair, "Neuromorphic Circuits & Systems for Robotics", IEEE International Symposium on Circuits and Systems. May 2017.

Organizer of the workshop on *Interacting With Robots Through Touch*, University of California, Irvine, September 2016.

Topic Area leader for “Neuromorphic Path Planning for Robots in a Disaster Response Scenario” at the *Telluride Neuromorphic Cognition Engineering* workshop, July 2016.
Organizer of the IEEE International Conference of Robotics and Automation Workshop on Neurobiologically Inspired Robotics, Hong Kong, June 2014.
Organizer of the 21st *Joint Symposium on Neural Computation*, University of California, Irvine, May 2014.
Co-Organizer of the 15th *Annual Joint Symposium on Neural Computation*, University of California, Irvine, May 2008.
Co-Organizer of *Brain-style Robotics: Trends and Perspectives* at The 14th International Conference on Neural Information Processing, Kitakyushu Japan, November 2007.
Organizing committee of the International Workshop on Cognitive Robotics, Intelligence and Control (CogRIC) in Windsor UK, August 2006.
Co-chair of the Segway League at the RoboCup US Open in Atlanta, GA, May 2005.
Co-Organized the *Neurorobotic Models in Neuroscience and Neuroinformatics* workshop at the Eighth International Conference on the Simulation of Adaptive Behavior in Los Angeles, CA, July 2004.

PROGRAM COMMITTEES

External Review Panel, Sandia National Laboratories.
Chairman, Decade of the Mind Initiative Steering Committee.
7th International Conference on Development and Learning (ICDL-08).
Area Chair, 8th International Conference on Development and Learning (ICDL-09).
SAB 2008 - Simulation of Adaptive Behavior 2008.
ECAL2007 - 9th European Conference on Artificial Life.

EDITING AND REVIEWING

Managing Editor, Special Issue on “Neurobiologically Inspired Robotics: Enhanced Autonomy Through Neuromorphic Cognition” for *Neural Networks*.
Associate Editor, 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems.
Academic Editor, *International Journal of Humanoid Robotics*
Associate Editor, *IEEE Transactions on Cognitive and Developmental Systems*
Associate Editor, *Frontiers in Neuromorphic Engineering*
Academic Editor, *Frontiers in Neuroinformatics*
Guest Editor, Special Issue on What can computer vision learn from visual neuroscience? in *Biological Cybernetics*. 2023.
Guest Editor, Special Issue on Cognitive Robotics in *IEEE Robotics and Automation Magazine*. 2009.
Editor, Special issue of the journal *Neuroinformatics* on “Neurorobotic Models in Neuroscience and Neuroinformatics, Fall 2005.
Reviewer, *Adaptive Behavior*.
Reviewer, *Artificial Life*.

Reviewer, *Cognitive Systems Research*
Reviewer, *Frontiers in Neural Circuits*
Reviewer, *Frontiers in Neuroinformatics*
Reviewer, *Frontiers in Psychology*
Reviewer, *Hippocampus*
Reviewer, *IEEE Computational Intelligence*.
Reviewer, *IEEE Transactions on Neural Networks*.
Reviewer, *Journal of Cognitive Neuroscience*
Reviewer, *Journal of Integrative Neuroscience*
Reviewer, *Journal of Neuroscience*
Reviewer, *Journal of Neuroscience Methods*
Reviewer, *Neurocomputing*.
Reviewer, *Neural Networks*.
Reviewer, *Proceedings of the National Academy of Science*
Reviewer, *Public Library of Science (PLOS)*
Reviewer, *Public Library of Science (PLOS) Computational Biology*
Reviewer, *Science*

INVITED TALKS

1. “Neuromorphic Path Planning for Mobile Robots.”, University of Santa Barbara, May 2024.
2. “Neurorobotics: Connecting the Brain, Body and Environment.”, Tufts University, March 2024.
3. “Artificial Intelligence in Culture and Media.”, Tufts University, March 2024.
4. “Neurorobotics: Connecting the Brain, Body and Environment”., Anteater Family Weekend, UC Irvine, Irvine CA, October 2023.
5. “Neurorobotics: Connecting the Brain, Body and Environment”., Paramount Picture Studios, Los Angeles CA, April 2023.
6. “Neurorobotics Navigation”, Tufts University, Medford MA, March 2023.
7. “Neurorobotics: Connecting the Brain, Body and Environment”, Tufts University, Medford MA, March 2023.
8. “Biologically Inspired Algorithms for Continuous Online Robot Navigation”, Queensland University of Technology, Brisbane, Australia, June 2023.
9. Design Principles for Neurorobotics. University of Southern California, Los Angeles, January 2023.
10. Design Principles for Neurorobotics. Simulation of Adaptive Behavior, Cergy-Pointoise, France, September 2022.
11. “Neurorobotics: Connecting the Brain, Body and Environment.” iCog: Istituto Italiano di Tecnologia (IIT), April 2021.
12. “Neurorobotics: Connecting the Brain, Body and Environment.” Trans Air Virtual Workshop on Cognitive Architectures for Robot Agents, March 2021.
13. “Neurorobots as a Means Toward Neuroethology and Explainable AI.” Virtual Workshop on Explainable AI, International Neural Network Society, November 2020.
14. “A Neurobiological Schema Model for Contextual Awareness in Robotics”, NeuroDevRob: Robotics, Development and Neurosciences. Cergy-Pontoise (France),

December 2019.

15. "Neurorobotics: A Thriving Community and a Promising Pathway Toward Intelligent Cognitive Robots", Neurorobotics Research Consortium, University of Minnesota, June 2019.
16. "LASER Talk: Artificial Life + Intelligence, UCI Applied Innovation, February 2019.
17. "Robots are Here to Help! Developing smarter robots to improve our lives", UC Irvine Homecoming, February 2019.
18. "Neurorobotics: A Thriving Community and a Promising Pathway Toward Intelligent Cognitive Robots", Saddleback College Emeritus Institute - Dorothy Marie Lowry Distinguished Guest Lecture Series, Laguna Woods, CA, January 2019.
19. "Efficient Coding, Prediction and Mental Imagery for Intelligent, Cognitive Behavior in Robots", Contextual Robotics Institute, University of California, San Diego, February 2018.
20. "Efficient Coding, Prediction and Mental Imagery for Intelligent, Cognitive Behavior in Robots", Keynote at The Second IEEE International Conference on Robotic Computing, Laguna Hills, CA, February 2018.
21. "Sensory Integration Therapy for ASD in a Touch Based Assistive Robot", Brain Institute, Vanderbilt University, Nashville, TN, December 2017.
22. "Efficient, Predictive Coding and Thermodynamic Computing", Keynote at the Intelligent Cognitive Assistants Workshop IBM Research-Almaden, San Jose, California, November 2017.
23. "Sparse Coding, Dimensionality Reduction, and Synaptic Plasticity: Evolving and Validating Biologically Realistic Models", Institute of Neural Computation, University of California, San Diego, June 2017.
24. "Sparse Coding, Dimensionality Reduction, and Synaptic Plasticity: Evolving and Validating Biologically Realistic Models", Institute of Neural Computation, Sandia National Laboratories, Albuquerque, NM, June 2017.
25. "Neurorobots – Understanding the Brain and Creating More Intelligent Machines", Tufts University, Medford Massachusetts, March 2017.
26. "A Socially Assistive Robot That Interacts With People Through Tactile And Bi-Directional Learning", Workshop on Body Map and Touch Perception in Brains, Robots and Babies, Maison de la Recherche (MIR) de l'universite de Cergy-Pontoise, Neuville.
27. "Adaptive Robot Path Planning Using a Spiking Neuron Algorithm with Axonal Delays", University of Cergy-Pontoise, Cergy, France, December 2016.
28. "Towards a Modeling Framework for the Efficient Creation, Simulation and Analysis of Brain Functions", 2016 International Symposium on Neuromorphic Cognitive Computing and Robotics, Chengdu, China, September 2016.
29. "Towards a modeling framework for the efficient creation, simulation and analysis of brain functions". Keynote speaker at the 2016 INCF Neuroinformatics meeting, Reading, UK, September 2016.
30. "A Framework for Replicating Neurophysiological Data that Leverages Evolutionary Algorithms and GPU Acceleration", Workshop on "Evolution in Cognition" at the Genetic and Evolutionary Computation Conference (GECCO), Denver, CO, July 2016.
31. "Neurorobotics and Neuromorphic Engineering: A Brain Inspired Approach to Developing Robot Control Systems." Mechanical and Aerospace Dynamics Control Seminar, University of California, San Diego, May 2016.

32. "Brain-Based Robots: A Means to Creating More Intelligent Machines." Academic Business Officer Group (ABOG) Conference, Irvine CA, April 2016.
33. "Value Systems: Precursor to Emotion?" Emotions as Feedback Signals workshop at the Lorentz Center, Leiden, Netherlands, April 2016.
34. "Brain-Based Robots A Means to Creating More Intelligent Machines", Upward Bound, University of California, Riverside, January 2016.
35. "A Cortical Neural Network Model for Visually Guided Robot Navigation", at the IJCNN 2015 Workshop on Spatial Representations in Biology and Robots, Killarney, Ireland, July 2015.
36. "Large-Scale, Biologically Detailed Neuromorphic Networks: Taming the Beast", Northrop-Grumman, Redondo Beach, CA, February 2015.
37. "CARL-SJR: A Tactile, Interactive Robot for Developmental Disorder Therapy", Temporal Dynamics of Learning Center, University of California, San Diego, February 2015.
38. "CARL-SJR: A Socially Assistive Robot with Rich Tactile Sensory Interaction", Institute for Neural Computation, University of California, San Diego, October 2014.
39. Combining Neuromorphic Applications With Neurorobotics: A Large-Scale Cortical Model For Visually Guided Navigation, Institut für Informatik der Technischen Universität München, Munich, Germany, October 2014.
40. "GPGPU Accelerated Simulation and parameter tuning for Neuromorphic Applications", Neuro-Inspired Computing Elements workshop, Albuquerque, NM, February 2014.
41. "Neuromodulation and Neurobots", Qualcomm Research Center, Qualcomm Incorporated, San Diego, CA, July 2013.
42. "Brain principles and modeling abstractions", International Workshop on Neuromorphic and Brain-Based Computing Systems, Design Automation Test in Europe, Grenoble, France, March 2013.
43. "Neuromorphic modeling abstractions and simulations of large-scale cortical networks", Dynamics of multifunction brain networks MURI Winter School, San Diego, CA, January 2013.
44. "Design Principles for Biologically Inspired Cognitive Robotics", Dynamics of multifunction brain networks MURI Winter School, San Diego, CA, January 2013.
45. "Design Principles for Biologically Inspired Cognitive Robotics", Graduate School of Engineering, Osaka University, Japan, August 2012.
46. "Neuromodulation as a Robot Controller: A Brain-Inspired Strategy for Controlling Autonomous Robots and Studying Decision-Making", Queensland University of Technology, Brisbane Australia, June 2012.
47. "Design principles for biologically inspired cognitive robotics." Sixteenth International Conference On Cognitive And Neural Systems, Boston University, Boston, MA, May 2012.
48. "Brain-Based Robots and Neuromorphic Engineering, Computer Science Seminar", University of California, Irvine, January 2012.
49. "Neuromorphic Modeling Abstractions and Simulation of Large-Scale Cortical Networks." IEEE/ACM International Conference on Computer-Aided Design (ICCAD), San Jose, CA, November 2011.
50. "Neuromorphic and Brain-Based Robots", International Conference on Biologically Inspired Cognitive Architectures, Washington, DC, November 2011.

51. “Neuromodulation as a Brain-Inspired Strategy for Controlling Autonomous Robots and a Means to Investigate Social Cognition during Human-Robot Interactions”, Dynamics of Brain-Body-Environment Systems colloquium, Indiana University, Bloomington, IN, October 2011.
52. “Understanding Cognition Through Building Brain-Inspired Robots”, INSIDE UCI Series, Summer Session 2011, University of California, Irvine, August, 2011.
53. "Computational Approaches in Cognitive Neuroscience: Case studies in neurobotics and large-scale cortical modeling", National Brain Research Centre, Manesar, Haryana, India, July 2011.
54. “Computational Approaches in Cognitive Neuroscience”, Brain and Cognition Workshop, The Centre for Neuroscience, Indian Institute of Science, Bangalore, India, July, 2011.
55. “Building Brain-Inspired Robots (SC 215)”, Osher Life Long Learning Institute, Irvine, CA, December 2010.
56. “Understanding Cognition through Building Brain-Inspired Robots”, The Inside Edge Foundation for Education, Irvine, CA, November 2010.
57. “Effect of Neuromodulation on Human-Robot Interactions and Game Playing”, Electrical Engineering and Computer Science Technical Seminar Series, University of California, Merced, October 2010.
58. “Effect of Neuromodulation on Cooperative Behavior: A Human-Neurobot Interaction Study”, at the Beyond Brain Machine Interfaces workshop, 2010 Neural Interfaces Conference, Long Beach, CA, June 2010.
59. “Understanding Cognition through Building Brain Inspired Robots” at the Chief Executive Roundtable Retreat, Cavallo Point in Sausalito, California, May 2010.
60. “Neurobotics and Modeling Cognitive Function” at the Expert Speaker Series for the School of Social Sciences, University of California, Irvine, February 2010.
61. “Neurobotics and Modeling Cognitive Function” at the Chancellor’s Club, University of California, Irvine, October 2009.
62. “Using neurally inspired robots to study brain function: Principles and mechanisms” at the Artificial Intelligence Laboratory, University of Zurich, Zurich, Switzerland, September 2009.
63. “Using neurally inspired robots to study brain function: Principles and mechanisms” at the Laboratory of Intelligent Systems, Ecole Polytechnique Federal de Lausanne, Lausanne, Switzerland, August 2009.
64. "Using neurally inspired robots to study brain function: Principles and mechanisms" at the symposium on *Models of vision and decision-making: From features to behavior and perceptual robotics* in the 32nd European Conference on Visual Perception (ECVP'09), Regensburg, Germany, August 2009.
65. “Neurobotics, Brain-Based Devices, and Modeling Cognitive Function”, Nour Foundation-Georgetown University Symposium on The Paradox of Neurotechnology, Georgetown University, Washington, DC, May 2009.

66. "Neurorobotics, Neuromodulation, and Modeling Cognitive Function", Sloan-Swartz Center for Theoretical Neurobiology at the Salk Institute, La Jolla, CA, April 2009.
67. "Cognitive Robotics: Studying Cognitive Functions with Embodied Models of the Nervous System", at the Artificial Intelligence and Machine Learning Seminar, Center for Machine Learning and Artificial Intelligence, University of California, Irvine, January 2009.
68. "Neurorobotics and Modeling Cognitive Function" at the Decade of the Mind IV Conference, Santa Ana Pueblo, NM, January 2009.
69. "Cognitive Robotics: Studying Cognitive Functions with Embodied Models of the Nervous System", at the Brain and Technology Summer School, Barcelona, Spain, September 2008.
70. "Neuromodulation and Time-Dependent Plasticity in a Model of Foraging Behavior", *15th Annual Joint Symposium on Neural Computation*, University of California, Irvine, May 2008.
71. "Design Principles and Constraints Underlying the Construction of Brain-Based Devices", RIKEN Brain Science Institute, Saitama, Japan, November 19, 2007.
72. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", Mechanical and Aerospace Engineering Department, Cornell University, Ithaca, NY, October 2007.
73. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", at the College of Architecture, Art, and Planning, Cornell University, Ithaca, NY, October 2007.
74. "Brain-Based Devices: Studying Brain Function by Developing Embodied Models of the Nervous System", at Hughes Research Laboratories, Malibu, CA, September 2007.
75. Brain-based Devices: Studying Cognitive Functions with Embodied Models of the Nervous System, euCognition the European Network for the Advancement of Artificial Cognitive Systems' Third Six-Monthly Meeting, Munich Airport, 29 June 2007.
76. "Computational Neuroscience", at the Workshop in Cognitive Neuroscience. Centros de Neurociencias de Cuba, Havana Cuba, June 4-8, 2007.
77. "Brain-based Devices: Studying brain function by developing embodied models of the nervous system", at the Center for Intelligent Systems, Vanderbilt University, April 2007.
78. "Causal Analysis of Large-Scale Embodied Models of the Hippocampus and Cerebellum: Tracing Back Through Time" at the Interdisciplinary Program in Neuroscience Seminar at Georgetown University, November 2006
79. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Applied Neural Computing workshop, Engineering and Medicine in Biology Conference (EMBC), August 2006, New York, NY.
80. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Cognitive Robotics, Intelligence, and Control (CogRIC) workshop, August 2006, Windsor, UK.
81. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Orange County IEEE/ACM Society chapter meeting, July 2006, Irvine, CA.

82. "The Brain as a Complex System: Tools to Analyze Simulated and Real Nervous Systems", by Jeffrey Krichmar at the DARPA Complex Systems Architectures Workshop, Arlington, Virginia, June 2006.
83. "Analysis of Large-Scale Embodied Neural Models by Tracing Back Through Time", by Jeffrey Krichmar at the Artificial Life conference workshop on *Neurodynamic Methods for analysis and control of cognitive behaviors*, Bloomington, Indiana, June 2006.
84. "Principles Underlying the Construction of Brain-Based Devices", by Jeffrey Krichmar at the Adaptation in Artificial and Biological Systems symposium on "GC5: Architecture of Brain and Mind," Bristol UK, April 2006
85. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the California State Summer School at University of California at San Diego, July 2005.
86. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the Robotics/Computer/Computational Intelligence Societies Chapter Meeting, San Diego, CA, May 2005.
87. "Characterizing Hippocampal Pathways in a Brain-Based Device during a Spatial Memory Task", by Jeffrey Krichmar at the *Ninth International Conference On Cognitive And Neural Systems* in Boston, May 2005.
88. "Object recognition, Adaptive Behavior and Learning in Brain-Based Devices" presented by Jeffrey Krichmar at the *Third International Conference on Development and Learning* in La Jolla, CA, October 2004.
89. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", presented by Jeffrey Krichmar at the *Potomac Institute for Policy Studies* in Washington, DC, September 2004.
90. "Engineering of brain-based devices", presented by Jeffrey Krichmar at the *Information Science and Technology Study Group* in Woods Hole, MA, August 2004.
91. "Spatial and Episodic Memory in a Real-World Device Containing a Model of Hippocampal-Cortical Interactions", presented by Jeffrey Krichmar at the *Neurorobotic Models in Neuroscience and Neuroinformatics* workshop in Los Angeles, CA, July 2004.
92. "Texture discrimination by an autonomous mobile brain-based device with whiskers", presented by Jeffrey Krichmar at the *IEEE International Conference on Robotics and Automation* in New Orleans, LA, April 2004.
93. "Brain-Based Devices: Studying the Nervous System and Developing Intelligent Machines Based on Neurobiological Principles", by Jeffrey Krichmar at the *Mobile Autonomous Robot Software (MARS) PI Meeting* in New Orleans LA, April, 2004.
94. "Brain-Based Devices for the Study of Nervous Systems and the Development of Intelligent Machines", by Jeffrey Krichmar at the *Augmented Cognition PI Meeting* in Orlando FL, January, 2004.
95. "Visual Binding Through Reentrant Connectivity And Synchronization In A Brain-Based Device", by Jeffrey Krichmar at the *Seventh International Conference On Cognitive And Neural Systems* in Boston, May 2003.

96. "Machine Psychology: Autonomous behavior, perceptual categorization, and conditioning in a brain-based device", by Jeffrey Krichmar at the *International Interdisciplinary Seminar On New Robotics, Evolution And Embodied Cognition* in Lisbon, Portugal. November 2002.
97. "Machine Psychology: Experience-Dependent Perceptual Categorization and Learning in a Brain-Based Device", by Jeffrey Krichmar at the "Experience and Developing Brain Symposium" at the Jean Piaget Society Annual Meeting in Philadelphia, PA. June 2002.
98. "A Neural Approach to Adaptive Behavior and Multi-Sensor Action Selection in a Mobile Device", presented by Jeffrey Krichmar at the 2002 IEEE International Conference on Robotics & Automation, Washington, DC. May 2002.
99. "Categorization And Value Systems As A Means Toward Action Selection In A Brain-Based Device", by J. Krichmar at the Modulation and Modification of Sensor-Motor Coupling workshop in Stirling U.K. February 2002.
100. "Categorization And Value Systems As A Means Toward Action Selection In A Brain-Based Device", by J. Krichmar at the Department of Cybernetic, Reading University, Reading U.K. February 2002.
101. "Visual and Auditory Categorization In A Behaving Real-World Device", by J. Krichmar at the Workshop on Visual and Auditory Categorization In A Behaving Real-World Device, IEEE International Symposium on Computational Intelligence in Robotics and Automation, Banff, Alberta, Canada. July 2001.
102. "Machine psychology: Studying behavior and the brain with devices that explore a real world environment" by J. Krichmar at the Krasnow Institute for Advanced Study at George Mason University, Fairfax, VA. April 2001.
103. "Brain-Based Devices: Studying Behavior and the Nervous System with Devices that Explore a Real World Environment", by J. Krichmar at the 68th Meeting of the Neurosciences Research Program, The Neurosciences Institute, San Diego, CA. March 2001.
104. "Experience-dependent Perceptual Categorization in a Behaving Real-World Device", by J. Krichmar at the Sixth International Conference on Simulation of Adaptive Behavior, Paris, France. September 2000.
105. "The Need for Computational Neuroanatomy: Neuromorphology's Shaping of Neurophysiology.", Computational Neuroanatomy Symposium: Experimental Biology Meeting, April 2000, San Diego, CA.
106. "Oculomotor Indicators of Fatigue and Impairment.", Psychophysiology in Ergonomics Symposium: ANS and CNS Indices of Attention, Workload, and Fatigue. 38th Annual Meeting of the Society for Psychophysiological Research, 1998.
107. "Hippocampus – Larger than Life: Constructing a Large-Scale Model", April 1998, Laboratory of Neural Control, NINDS, National Institute of Health, Washington, DC.
108. "Hippocampus – Larger than Life: Constructing a Large-Scale Model.", February 1998, Krasnow Institute for Advanced Study, George Mason University, Fairfax, VA.

109. “Qualitative reasoning as a modeling tool for computational neuroscience.”, June 1997, Mathematical Branch, NIDDK, National Institute of Health, Washington, DC.

RESEARCH INTERESTS

Autonomous Robots

Neurorobotics

Neuromorphic Engineering

Machine Psychology: Understanding the brain by using real-world behaving devices.

Biologically plausible computer models of learning and memory.

Large-scale computational models of the hippocampus and cerebellum.

Motor control in the oculomotor system.

Fatigue and drug detection.

PREVIOUS FUNDING

W.M. Keck Foundation

Defense Advanced Research Projects Agency (DARPA)

- Systems of Neuromorphic Adaptive Plastic Scalable Electronics (SyNAPSE)
- Mobile Autonomous Robot Software (MARS)

Intelligence Advanced Research Projects Activity (IARPA)

- Integrated Cognitive-Neuroscience Architectures for Understanding Sensemaking (ICArUS)

Office of Naval Research

National Science Foundation

- Emerging Models and Technologies for Computation
- Robust Intelligence

Qualcomm Incorporated

Northrop Grumman Aerospace Systems

UCI Applied Innovation

CURRENT FUNDING

Defense Advanced Projects Agency (DARPA)

Intel Corporation

National Science Foundation

Toyota Motors North America

WORKSHOPS AND MEETINGS ORGANIZED

Steering Committee, 2018 conference on “Technology, Mind & Society”, American Psychological Association, Washington DC.

Session Chair, “Advanced Unmanned Systems: Requirements and Groundwork for the Next Generation of Robotics Systems”, The 8th International Conference on Applied Human Factors and Ergonomics (AHFE 2017).

Session Chair, “Neuromorphic Circuits & Systems for Robotics”, IEEE International Symposium on Circuits and Systems. May 2017.

Organizer of the workshop on *Interacting With Robots Through Touch*, University of California, Irvine, September 2016.

Topic Area leader for “Neuromorphic Path Planning for Robots in a Disaster Response Scenario” at the *Telluride Neuromorphic Cognition Engineering* workshop, July 2016.

Organizer of the IEEE International Conference of Robotics and Automation Workshop on Neurobiologically Inspired Robotics, Hong Kong, June 2014.

Organizer of the 21st *Joint Symposium on Neural Computation*, University of California, Irvine, May 2014.

Co-Organizer of the 15th *Annual Joint Symposium on Neural Computation*, University of California, Irvine, May 2008.

Co-Organizer of *Brain-style Robotics: Trends and Perspectives* at The 14th International Conference on Neural Information Processing, Kitakyushu Japan, November 2007.

Organizing committee of the International Workshop on Cognitive Robotics, Intelligence and Control (CogRIC) in Windsor UK, August 2006.

Co-chair of the Segway League at the RoboCup US Open in Atlanta, GA, May 2005.

Co-Organized the *Neurorobotic Models in Neuroscience and Neuroinformatics* workshop at the Eighth International Conference on the Simulation of Adaptive Behavior in Los Angeles, CA, July 2004.

PROGRAM COMMITTEES

External Review Panel, Sandia National Laboratories.

Chairman, Decade of the Mind Initiative Steering Committee.

7th International Conference on Development and Learning (ICDL-08).

Area Chair, 8th International Conference on Development and Learning (ICDL-09).

SAB 2008 - Simulation of Adaptive Behavior 2008.

ECAL2007 - 9th European Conference on Artificial Life.

COMMUNITY SERVICE

2017 California Alliance for Minority Participation

2016 Upward Bound, UC Riverside.

2013-Present The National Academy of Sciences - Science & Entertainment Exchange.

2013-Present Director, Center for Cognitive Neuroscience and Engineering.

- 2012 Stonegate elementary school, Irvine CA.
- 2011-2012 Mathobotix
- 2009 Chancellors Club – University of California, Irvine
- 2009 Falmagne Award Committee
- 2008 Robotics Club, Torrey Hills School
- 2008 California Forum for Diversity in Graduate Education
- 2004-2012 FIRST Lego League Robotics. Awarded for outstanding service as a volunteer.
- 2003-2009 *Expanding Your Horizons (EYH) Conference* at the University of California, San Diego (UCSD). Ran workshops on Robotics and Learning to increase the interest of young women in math and science through fun, hands-on learning opportunities.
- 2002-2007 *Botball Robotics Mentor/Judge* - a hands-on learning experience in robotics designed to engage students in learning the practical applications of science, technology, engineering and math.
- 2007 Rancho Santa Fe Discovery Day
- 2006 California State 4-H Leadership Conference, Ran workshop on robotics.
- 2005-2009 California State Summer School for Mathematics and Science (COSMOS)
- 2005 Community Day, La Jolla Country Day School.
- 2004-2006 San Diego Science Alliance RoboExpo – Demonstrated Brain-Based Robotics to Junior High School and High School students and teachers.

SOCIETIES

- 2011 - Present Biologically Inspired Cognitive Architectures (BICA) Society
- 1994 - Present Society for Neuroscience
- 1996 - 1999 Association for Research in Vision and Ophthalmology

2000 - Society for Adaptive Behavior
Present

2000 - IEEE Robotics and Automation
Present

HONORS AND AWARDS

1979-80 Varsity Letters in Cross Country, Indoor Track and Outdoor Track
1983 Dean's List
1990 Passed Comprehensive Examination with Distinction
1990 3.7 GPA at The George Washington University
1996 Passed Ph.D. Candidacy Examination in Computational Sciences and Informatics at George Mason University
1997 3.9 GPA at George Mason University
1998 President, Potomac Chapter of the Society for Neuroscience
2018 Entrepreneurial Leader of the Year Nominee, UCI Applied Innovation